



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/275,578	03/24/1999	MASAYOSHI SHINOHARA	2803.62981	9928

7590 12/26/2001  
PATRICK G BURNS  
GREER BURNS & CRAIN  
SUITE 8660 - SEARS TOWER  
233 SOUTH WACKER DRIVE  
CHICAGO, IL 60606

EXAMINER

BERNATZ, KEVIN M

ART UNIT	PAPER NUMBER
----------	--------------

1773

DATE MAILED: 12/26/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n N .

09/275,578

Examiner

Kevin M Bernatz

Applicant(s)

SHINOHARA ET AL.

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-9 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Amendment***

1. Preliminary amendments to the specification and claim 1, filed on October 5, 2001, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Continued Prosecution Application***

3. The request filed on October 5, 2001 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) is acceptable and a CPA has been established. An action on the CPA follows.

### ***Claim Rejections - 35 USC § 103***

4. Claims 1 – 3, 5, 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (U.S. Patent No. 6,120,890) in view of Okumura et al. (U.S. Patent No. 5,480,733) and Ishikawa et al. (U.S. Patent No. 6,057,021).

Regarding claim 1, Chen et al. disclose a magnetic recording disk comprising a nonmagnetic glass or silicon substrate, a first underlayer containing chromium as a principal component thereof, a second underlayer consisting of nickel and phosphorus and a third underlayer containing chromium as a principal component thereof, formed in the described order, wherein the second underlayer has a thickness of not less than 5

Art Unit: 1773

nm, contains P in the concentration of 15 to 33 atom % in the NiP layer and the third underlayer has a thickness of not more than 60 nm, and a magnetic recording layer containing cobalt as a principal component thereof, and also contains chromium in an amount of at least 14 atom % and platinum in an amount of at least 4 atom % in combination with tantalum or tantalum or niobium (col. 1, lines 16 – 21; col. 5, lines 37 – 65; col. 6, lines 41 – 62; col. 7, lines 1 – 25; col. 7, line 59 bridging col. 8, line 4; col. 8, lines 36 – 53; col. 8, line 63 bridging col. 9, line 13; and Figures). The limitations “sputtered” and “formed by ..” are product-by-process limitations and are given little or no weight in terms of evaluating the prior art since they are not further limiting in so far as the structure of the product is concerned. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP § 2113. Regarding the limitation “has a widened lattice spacing...”, the examiner deems that the underlayers disclosed by Chen et al. would inherently meet this limitation since they are identical to the third underlayers disclosed as acceptable by applicants and it is also well known to use underlayers to control the lattice matching between adjacent layers to facilitate desired epitaxial growth of the magnetic layer.

Chen et al. fail to disclose non-oriented irregularities on the glass substrate.

However, the examiner deems that “non-oriented irregularities” were inherently present on the Ohara glass substrates due to cleaning and pre-treatments as was old in the art at the time the invention in order to prepare the substrate for improved adhesion to deposited films (col. 6, line 67 bridging col. 7, line 3, “TS-10 Ohara glass substrates). The examiner further notes that applicants have no claimed limitation in terms of what constitutes a “non-oriented irregularity” and there is no showing of criticality in terms of exactly what applicants’ deem are encompassed by said limitation (i.e. applicants’ examples merely refer to a “well-cleaned disk-like glass substrate”, page 36).

Chen et al. further fail to teach a textured surface on the NiP layer and a magnetic layer possessing a circumferential easy axis of magnetization.

However, Okumura et al. disclose nearly an identical medium wherein a glass substrate is deposited with a Cr first underlayer, a NiP alloy second underlayer, a Cr third underlayer and a Co-alloy magnetic layer, wherein the second underlayer is textured in a circumferential direction in order to promote a circumferential direction of easy magnetization in the cobalt alloy magnetic layer to improve the magnetic anisotropy and coercivity (col. 1, lines 17 – 30; col. 3, line 36 bridging col. 4, line 62; and Table 1).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant’s invention to modify the device of Chen et al. to texture the NiP second underlayer as taught by Okumura et al., thereby producing a magnetic recording medium possessing a circumferential direction of easy magnetization and improved magnetic anisotropy and coercivity.

Neither Chen et al. nor Okumura et al. disclose the surface roughness in the radial direction after said texturing.

However, Ishikawa et al. teach that when one uses circumferential texturing to control the start-stop characteristics and magnetic anisotropy of a medium, one should produce circumferential textures wherein the surface roughness in the radial direction is controlled to within applicants' claimed limitations (col. 1, line 44 bridging col. 2, line 19; col. 3, line 26 bridging col. 4, line 16; col. 5, lines 19 – 30; col. 6, lines 19 – 60; col. 14, line 58 bridging col. 15, line 20; col. 15, line 60 bridging col. 16, line 26; and Table 1).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Chen et al. in view of Okumura et al. to include a surface roughness in the radial direction within applicants' claimed limitations as taught by Ishikawa et al. in order to produce a medium possessing good magnetic anisotropy and start-stop characteristics.

Regarding claim 2, Okumura et al. disclose texturing meeting applicants' claimed limitations, as described above.

Regarding claim 3, Ishikawa et al. disclose a surface roughness in the circumferential direction meeting applicants' claimed limitations (col. 14, line 58 bridging col. 15, line 20; col. 15, line 60 bridging col. 16, line 26; and Table 1).

Regarding claim 5, Chen et al. disclose a magnetic layer meeting applicants' claimed limitations (Table 1).

Regarding claim 9, Chen et al. disclose thickness values meeting applicants' claimed ranges (col. 5, lines 37 – 43; col. 6, lines 49 – 63; col. 8, lines 35 – 53; and Table 1).

Regarding claim 12, Chen et al. disclose protective layers meeting applicants' claimed limitations (col. 8, line 63 bridging col. 9, line 17).

5. Claims 6 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Okumura et al. and Ishikawa et al. as applied above, and further in view of Okuyama et al. (JP Patent No. 09-293227 A). See U.S. Patent No. 6,071,607, which is the US equivalent of Tokkyo Kokai 09-293227 A.

Regarding claims 6 and 7, Chen et al. in view of Okumura et al. and Ishikawa et al. disclose the claimed invention as described above.

While Chen et al. teach a CoCrPtTa alloy, none of the above teach an alloy composition comprising Ta and Nb.

However, Okuyama et al. teach a magnetic layer meeting applicants' claimed composition in order to obtain a combination of both low noise and high coercivity ('607: col. 6, lines 16 – 19; col. 19, lines 43 – 46; col. 22, lines 1 – 4; and Figure 25).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Chen et al. in view of Okumura et al. and Ishikawa et al. to include a magnetic layer meeting applicants' claimed composition limitations as taught by Okuyama et al. in order to obtain a combination of both low noise and high coercivity.

Regarding claim 8, Okuyama et al. disclose controlling the tBr value of the magnetic layer to within applicants' claimed range in order to insure an improved S/N ratio and high coercivity ('607: col. 9, line 66 bridging col. 10, line 31).

***Response to Arguments***

6. The rejection of claims 1, 2, 5 – 8 and 12 under 35 U.S.C § 103(a) – Tani et al. in view of Okuyama et al., Yamamoto and Ross

The rejection of claims 1, 3 and 9 under 35 U.S.C § 103(a) – Tani et al., Change et al., Yamamoto and Ross

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-6078 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.



KMB  
December 20, 2001



**STEVAN A. RESAN**  
**PRIMARY EXAMINER**